REMARKS

Claims 1-28 are pending in the application. By this Amendment, Claims 1 and 15 are amended. Favorable reconsideration is respectfully requested in light of the following Remarks.

I. The Claims Satisfy the Requirements of 35 U.S.C. 112, First and Second Paragraphs

The Office action rejects Claims 1-28 under 35 U.S.C. 112, first paragraph as failing to comply with the written description requirement, and Claims 1-28 under U.S.C. 112, second paragraph as being indefinite. The rejections are respectfully traversed.

By this Amendment, independent Claims 1 and 15 are amended to more clearly define the feature of the second surface of the metal foil (42) includes an interconnect pattern (46) in electrical contact with pads (47) located on a same side (32) of each solar cell (22) for electrically interconnecting a plurality of solar cells in a series string (44) such that electrical current from each solar cell (22) in the series string (44) is transported from the pads (47) and combined at an edge connector (50) of the metal foil (42). Support for this feature can be found, for example, in *Paragraphs [0020] and [0021]* and shown in *Figures 3 and 4 below.*

[0020] Referring now to Figure 3, metal foil 42 is patterned to segment the electrical interconnection of cells 22 such that the cells 22 can be grouped in a number of ways to provide a suitable current and voltage. Figure 2 shows a number of cells 22 connected in series and a number of wafer locations 45 illustrating an interconnect pattern 46 in such a series string 44. Each series string 44 may include a diode 48 that allows a failed string 44 to be bypassed.

[0021] Figure 4 illustrates a backside or second side 32 of a wafer 22 in a series string 44 of Figure 2. As shown in Figures 3 and 4, the current from the segments is

transported from corresponding pads 47 on a second side 32 of each cell 22 in a series string 44 and combined at an edge connector 50 of the metal foil 42 corresponding to an edge of the laminate. Figure 3 also illustrates how diodes 48 that may be used to bypass failed segments are mounted to foil 42.

FIG. 3

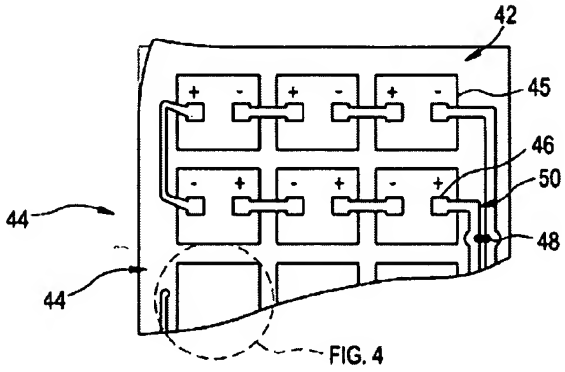
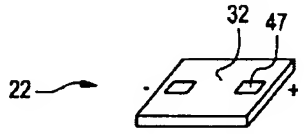


FIG. 4



In view of the foregoing, it is respectfully submitted that independent Claims 1 and 15, as amended, satisfy the requirements of 35 U.S.C. 112, first and second paragraphs. Withdrawal of the rejection is respectfully requested.

II. The Claims Define Patentable Subject Matter

1. The Office action rejects Claims 1-3, 7-12, 15-17 and 21-26 under 35 U.S.C. 103(a) over Cole (U.S. Patent No. 6,008,449, hereinafter "Cole") in view of Evans Jr. et al. (U.S. Patent No. 4,341,918, hereinafter "Evans"). The rejection is respectfully traversed.

By this Amendment, independent Claims 1 and 15 are amended to include the

feature of a second surface of a metal foil including an interconnect pattern in electrical contact with pads located on a same side of each solar cell for electrical interconnecting a plurality of solar cells in a series string such that electrical current from each solar cell in the series string is transported from the pads and combined at an edge connector of said metal foil, the series string including a bypass diode for allowing the series string to be bypassed in case of failure of the series string. (Emphasis added). Support for this feature can be found, for example, in *Paragraphs [0020] and [0021]* and shown in *Figures 3 and 4 above.*

Cole discloses electrically connecting opposite sides of each solar cell 22 to the reflective layer 48 in series, as shown in *Figs. 1 and 5* below.

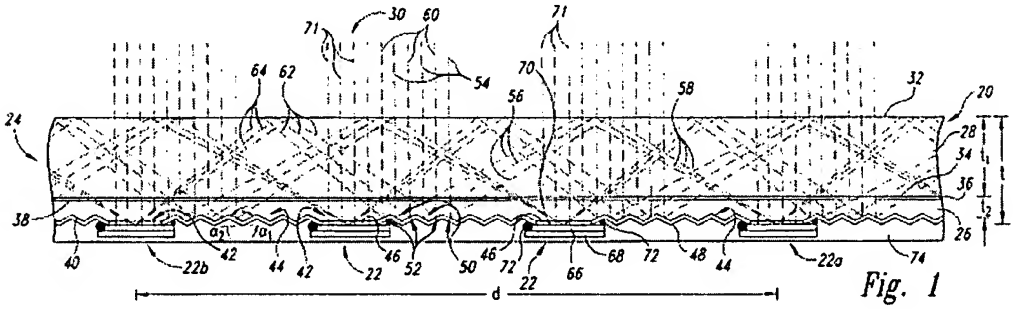


Fig. 1

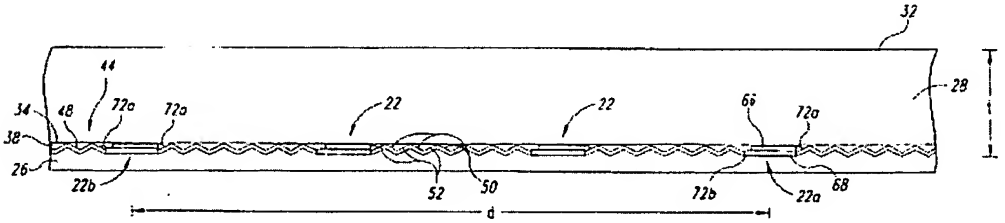


Fig. 5

Applicant agrees with the Office action that Cole does not teach an edge connector and a plurality of solar cells connected in series by pads located on the same side of each solar cell.

Evans discloses a unit cell comprising doped regions 20, 22 separated by a gap or undiffused region 24 and contacts 26 for connecting adjacent unit cells together in series, as shown in Fig. 1 below.

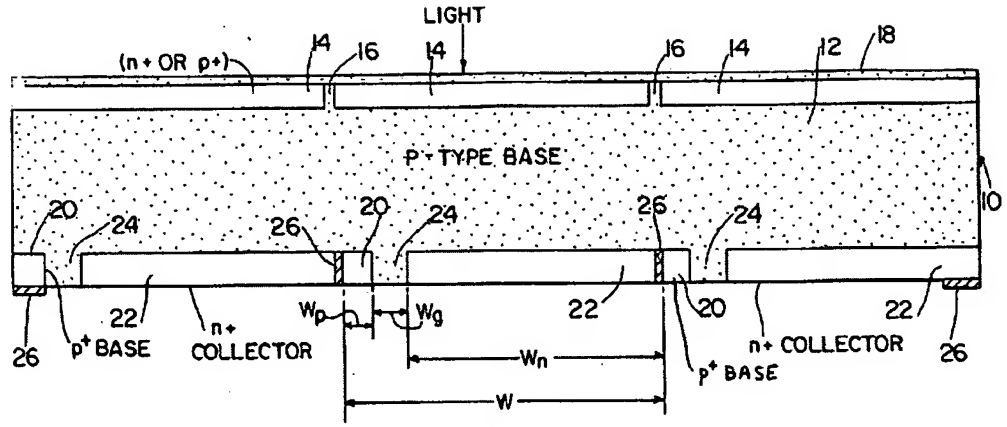


FIG. 1

In another embodiment, Evans teaches that the unit field regions 14 of Fig. 1 can be replaced by collector regions formed in both surfaces of the p-type base 10'. The collector regions in the two surfaces overlie one another and a pair of contacts 40 located at opposite edges of the cell assembly are used to make connection to solar cells at the lateral edges of the assembly. See *Fig. 2 below; col. 6, lines 37-55.*

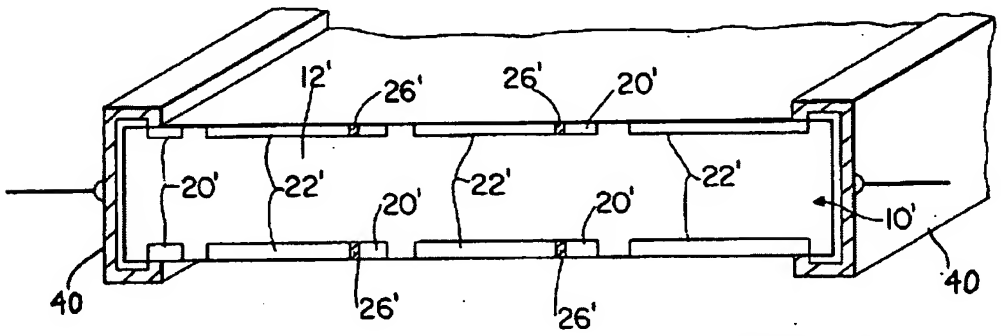


FIG. 2

To overcome the shortcomings in Cole, the Office action asserts that:

"[i]t would have been obvious to one skilled in the art at the time the invention was made to modify the solar cell assembly of Cole by incorporating edge connectors as taught by Evans Jr. et al., because Evans Jr. et al. teaches such edge connectors are used to make connection to the

> cells at the edges of the assembly. (See col. 6 lines 38-55). Since the edge connectors of Evans Jr. et al. are used as electrical contacts as seen in Figure 2; therefore, in the combination of Cole in view of Evans Jr. et al., a plurality of solar cells can obviously be connected in series by pads (or wraparound contacts 40) on a same side (e.g. the bottom side) of each solar cell." See *Page 6.*

Applicant disagrees with this assertion because the purpose of the contacts 40 in Evans is to interconnect adjacent solar cell assemblies, not each solar cell within an assembly. Further, the purpose of the edge connector of the claimed invention is to act as an electrical bus and combine the electrical current from each solar cell in the series string. See *Paragraph [0013].* Thus, the contacts 40 of Evans are a different structure that performs a different function as the edge connector of the claimed invention.

In addition, the combination of Cole and Evans does not disclose, teach or suggest a metal foil having an interconnect pattern that are in electrical contact with pads on the same side of each solar cell in a series string, as recited in independent Claims 1 and 15.

In view of the foregoing, the Office action fails to establish a *prima facie* case of obviousness, and the rejection of Claims 1 and 15 should be withdrawn.

Even if, *arguendo*, the Office action has established a *prima facie* case of obviousness with respect to the metal foil having an interconnect pattern for contacting pads on the same side of each solar cell, the combination of Cole and Evans does not disclose, teach or suggest the feature of a series string including a bypass diode for allowing the series string to be bypassed in case of failure of the series string, as recited in independent Claims 1 and 15.

For at least this additional reason, independent Claims 1 and 15 are allowable over the applied art, taken singly or in combination. Claims 2, 3 and 7-12, which depend from Claim 1, and Claims 16, 17 and 21-26, which depend from Claim 15, are likewise allowable over the applied art, taken singly or in combination. Withdrawal of the rejection is respectfully requested.

2. The Office action rejects Claims 4-6, 13, 18-20 and 27 under 35 U.S.C. 103(a) over Cole in view of Epstein et al. (U.S. Published Application No.

2003/0058553, hereinafter "Epstein"). The rejection is respectfully traversed.

Claims 4-6 and 13 depend from Claim 1, and Claims 18-20 and 27 depend from Claim 15. As admitted in the Office action, there is no mention in Cole of an edge connector and a plurality of solar cells connected in series by pads located on the same side of each solar cell, as recited in Claims 1 and 15. Epstein adds nothing to overcome this shortcoming in Cole. Thus, the combination of Cole and Epstein does not disclose, teach or suggest all the claim limitations, as recited in Claims 1 and 15, and therefore, the Office action fails to establish a prima facie case of obviousness.

For at least this reason, Claims 4-6, 13, 18-20 and 27 are allowable over the applied art, taken singly or in combination. Withdrawal of the rejection is respectfully requested.

In addition, there is no mention in Cole and Epstein of at least the feature of a series string including a bypass diode for allowing the series string to be bypassed in case of failure of the series string, as recited in independent Claims 1 and 15.

For at least this additional reason, Claims 4-6, 13, 18-20 and 27 are allowable over the applied art, taken singly or in combination. Withdrawal of the rejection is respectfully requested.

3. The Office action rejects Claims 14 and 28 under 35 U.S.C. 103(a) over Cole in view of Glenn (U.S. Patent No. 6,313,396, hereinafter "Glenn"). The rejection is respectfully traversed.

Claim 14 depends from Claim 1, and Claim 28 depends from Claim 15. As admitted in the Office action, there is no mention in Cole of an edge connector and a plurality of solar cells connected in series by pads located on the same side of each solar cell, as recited in Claims 1 and 15. Glenn adds nothing to overcome this shortcoming in Cole. Thus, the combination of Cole and Glenn does not disclose, teach or suggest all the claim limitations, as recited in Claims 1 and 15, and therefore, the Office action fails to establish a prima facie case of obviousness.

For at least this reason, Claims 14 and 28 are allowable over the applied art, taken singly or in combination. Withdrawal of the rejection is respectfully requested.

In addition, there is no mention in Cole and Glenn of at least the feature of a series string including a bypass diode for allowing the series string to be bypassed in case of failure of the series string, as recited in independent Claims 1 and 15.

For at least this additional reason, Claims 14 and 28 are allowable over the applied art, taken singly or in combination. Withdrawal of the rejection is respectfully requested.

4. The Office action rejects Claims 1-3, 7-12, 15-17 and 21-26 under 35 U.S.C. 103(a) over Coleman et al. (U.S. Patent No. 4,045,245, hereinafter "Coleman") in view of Cole, and further in view of Stein et al. (U.S. Patent No. 5,071,491, hereinafter "Stein"). The rejection is respectfully traversed.

Coleman discloses a solar cell package 10 including a back member 12, a plurality of solar cells 18, 20, 22, 24 having a top surface connected to a first conductor 30 by means of a conductor 36, such as a wire or a strap. See col. 2, line 66-col. 3, line 8. The conductor 30 is electrically connected to a terminal 54. A second conductive layer 32 is in electrical contact with each solar cell by means of members 44, 46, 48, 50. The conductor 34 is electrically connected to a terminal 56. See *Figs. 1 and 2 below.*

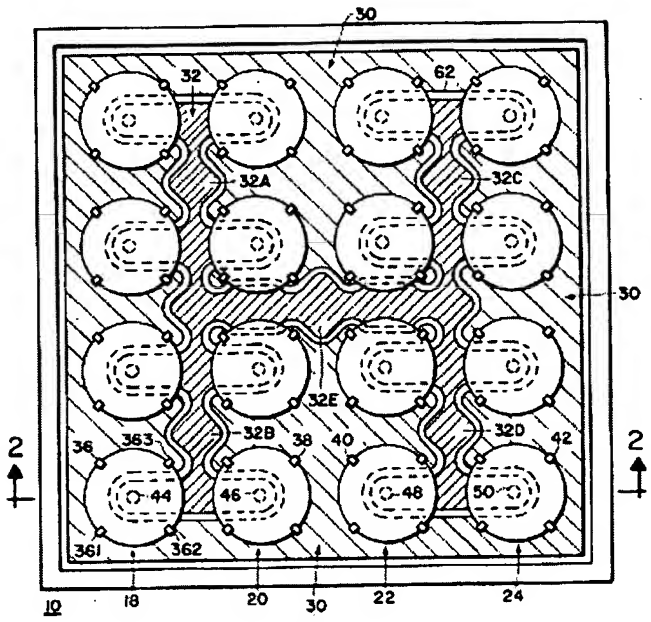


FIG. 1

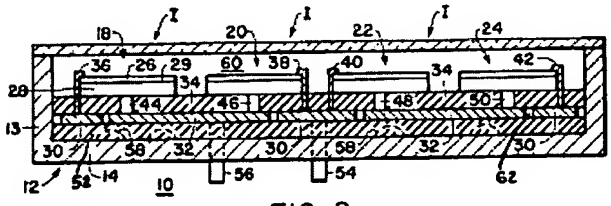


FIG. 2

The Office action asserts that:

[i]t would have been obvious to one skilled in the art at the time the invention was made to modify the solar cell package of Coleman et al. by having an insulative substrate, a metal foil having a patterned region exposed to light for concentrating to light as taught by Cole, and having the electrical current from each solar cell transported to the edge connector as taught by Stein et al.; because Cole finds that insulative substrate and metal foil are suitable material for structural support and conducting material and concentrating light back to solar cells would increase the efficiency (col. 4 lines 45-68 of Cole et al.), and Stein et al. teaches that transporting electrical current to the frame (or edge connector) would reduces the number of interconnection required in the overall device (See

Abstract of Stein et al.)" See *Page 13.*

Applicant asserts that the conclusion asserted by the Office action is an impermissible use of hindsight reconstruction. First, the upper surface of the solar cells in Coleman are electrically connected to the first conductors 30, 32 and isolated therefrom by an insulative layer 34. See *Fig. 2* above and *col. 2, lines 60-66.* To suggest that the Coleman solar package could be modified with a metal film that electrically connects the upper surface of the solar cells would render the Coleman solar package inoperable because the first and second conductors would not be electrically isolated by the insulative layer 34. In addition, Coleman requires that both the top surface and the bottom surface are connected to connectors 30, 32, not just one of the surfaces if Coleman was modified with an interconnect pattern electrically connected to pads on the same surface of each solar cell as in the claimed invention. This hindsight reconstruction is further magnified when suggesting that the metal film would also serve the dual purpose of reflecting light back to the solar cells, as suggested by the Office action. Stein adds nothing to overcome these shortcomings in Coleman and Cole.

For at least this reason, Claims 1-3, 7-12, 15-17 and 21-26 are allowable over the applied art, taken singly or in combination. Withdrawal of the rejection is respectfully requested.

In addition, there is no mention in the applied art of at least the feature of a series string including a bypass diode for allowing the series string to be bypassed in case of failure of the series string, as recited in independent Claims 1 and 15.

For at least this additional reason, Claims 1-3, 7-12, 15-17 and 21-26 are allowable over the applied art, taken singly or in combination. Withdrawal of the rejection is respectfully requested.

5. The Office action rejects Claims 4-6, 13, 18-20 and 27 under 35 U.S.C. 103(a) over Coleman in view of Cole, and further in view of Stein. The rejection is respectfully traversed.

Claims 4-6 and 13 depend from Claim 1, and Claims 18-20 and 27 depend from

Claim 15. As mentioned above, there is no mention in applied art of at least the feature of a series string including a bypass diode for allowing the series string to be bypassed in case of failure of the series string, as recited in independent Claims 1 and 15.

For at least this additional reason, Claims 4-6, 13, 18-20 and 27 are allowable over the applied art, taken singly or in combination. Withdrawal of the rejection is respectfully requested.

6. The Office action rejects Claims 14 and 28 under 35 U.S.C. 103(a) over Coleman in view of Cole, and further in view of Stein and Glenn. The rejection is respectfully traversed.

Claim 14 depends from Claim 1, and Claim 28 depends from Claim 15. As mentioned above, there is no mention in applied art of at least the feature of a series string including a bypass diode for allowing the series string to be bypassed in case of failure of the series string, as recited in independent Claims 1 and 15.

For at least this additional reason, Claims 14 and 28 are allowable over the applied art, taken singly or in combination. Withdrawal of the rejection is respectfully requested.

III. Conclusion

In view of the foregoing, it is respectfully submitted that the application is in condition for allowance. Favorable consideration and prompt allowance of the application is earnestly solicited.

Should Examiner Trinh believe anything further would be desirable in order to place the application in better condition for allowance, the Examiner is invited to contact the undersigned attorney at the telephone number listed below.

It is believed that any additional fees due with respect to this paper have already been identified. However, if any additional fees are required in connection with the filing of this paper, permission is given to charge account number 07-0868 in the name of General Electric Company.

Respectfully submitted,

17 April 2009

/Peter J. Rashid/

Peter J. Rashid
Reg. No. 39,464

Telephone: (810) 227-9077